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Structure and Proton Conductivity in Mixtures of Poly(acrylic acid) and Imidazole HAN-CHANG YANG, PHILIP J. GRIFFIN, KAREN I. WINEY, University of Pennsylvania, UNIVERSITY OF PENNSYLVANIA TEAM — Proton conductivity in polymer electrolyte membranes (PEMs) typically involves water, which requires that during operation the humidity of the PEM be carefully controlled. In contrast, anhydrous protic polymer membranes promote proton transport by incorporating heterocyclic molecules, such as imidazole and its derivatives, into acid-containing polymers. In this work, we explore the interplay between nanoscale-structure and proton conduction of poly(acrylic acid) (PAA) blended at varying compositions with 2-ethyl-4-methylimidazole (EMI). We present the glass transition temperature from differential scanning calorimetry, morphology characterization from X-ray scattering, and proton conductivity from electrical impedance spectroscopy.

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